

## CLAIMS.

- 1        1.        A webbing tie down assembly, comprising:  
2                a clamping mechanism comprising: a first clamping member having a first  
3                clamping surface, and a second clamping member having a second clamping surface, the  
4                two members being moveable to a clamping position in which the clamping surfaces are  
5                substantially together for clamping webbing therebetween, webbing under tension  
6                passing around the outer surface of the first clamping member and thence between the  
7                clamping surfaces to be clamped to the clamping mechanism,  
8                said second clamping member comprises a shaft, and the clamping surface of the  
9                first clamping member has a complementary curvature, so that the clamping surfaces of  
10              the first and second clamping members lie substantially parallel in the clamping position  
11              so that a clamping force on the webbing is distributed over a relatively large surface area  
12              of the webbing, and successive parts of the outer surface of the first clamping member  
13              smoothly merge into one another without any abrupt change of direction so that the  
14              webbing is not distorted.
- 1        2.        A webbing tie down assembly as claimed in claim 1 in which the outer surface of  
2              the first clamping member is curved.
- 1        3.        A webbing tie down assembly as claimed in claim 2 in which the minimum radius  
2              of curvature of the outer surface of the first clamping member is selected from 6.35 mm,  
3              4 to 9 mm, 5 to 8 mm.
- 1        4.        A webbing tie down assembly as claimed in claim 2 in which the first clamping  
2              member is kidney shaped in cross section, and the curvature of the front end surface of  
3              the first clamping member where the part of the webbing which carries the load first  
4              engages the first clamping member has a radius of curvature R1 selected from 6.35 mm, 4  
5              to 9 mm, 5 to 8 mm.
- 1        5.        A webbing tie down assembly as claimed in claim 4 in which the surface of the  
2              first clamping member extends from a forward point where the part of the webbing which

3 carries the load first engages the first clamping member smoothly in an arc of an  
4 increasing radius to an uppermost point and then decreases symmetrically to a rearmost  
5 point where the radius R3 is selected from 6.35 mm, 4 to 9 mm, 5 to 8 mm and the  
6 surface smoothly merges from said forward and rearmost points with the clamping  
7 surface of the first clamping member.

1 6. A webbing tie down assembly as claimed in claim 1 in which the webbing follows  
2 a serpentine path between the clamping surfaces.

1 7. A webbing tie down assembly as claimed in claim 1 in which the two members  
2 are moveable to a second position in which the clamping surfaces are moved apart for  
3 allowing webbing to slide therebetween.

1 8. A webbing tie down assembly as claimed in claim 1, comprising an inner frame  
2 supporting said first clamping member and comprises a first pair of substantially parallel  
3 inner plates, and an outer frame supporting said second clamping member and comprises  
4 a second pair of substantially parallel outer plates, the assembly further comprising a  
5 roller shaft, wherein the first pair of substantially parallel inner plates is mounted on the  
6 roller shaft to pivot between the clamping and second positions, and wherein in the  
7 clamping position, the inner plates of the first frame lie between the outer plates of the  
8 second frame

1 9. A webbing tie down assembly as claimed in claim 8, further comprising a latching  
2 mechanism, for securing the inner plates with respect to the outer plates in the clamping  
3 position.

1 10. A webbing tie down assembly as claimed in claim 9, wherein the first pair of  
2 substantially parallel inner plates are linked together by a handle for movement between  
3 the clamping and second positions.

1 11. A webbing tie down assembly as claimed in claim 9, including a tensioning  
2 mechanism comprising a pair of slots in respective ones of either the first pair of  
3 substantially parallel inner plates or the second pair of substantially parallel outer plates,

4 the roller shaft extending through the pair of slots and being rigidly mounted to the other  
5 of the first pair of substantially parallel inner plates or the second pair of substantially  
6 parallel outer plates, so that the inner frame can be displaced relative to the outer frame  
7 along the length of the slots.

1 12 A webbing tie down assembly as claimed in claim 1, in which the assembly has a  
2 first end and a second end, the first end carrying a hook for attachment to an object to be  
3 tied down, the hook being secured to the assembly at a pair of securing points.

1 13. A webbing tie down assembly as claimed in claim 12, in which the at least one  
2 supporting surface includes one or more pulley shafts arranged within the assembly to  
3 distribute the load of the webbing whilst spacing apart the surfaces thereof.

1 14. A webbing tie down assembly, comprising:  
2 an inner frame and an outer frame, the inner frame and the outer frame being  
3 arranged to support webbing therein and including a clamping mechanism comprising: a  
4 first clamping member supported by the inner frame and having a first clamping surface,  
5 and a second clamping member supported by the outer frame and having a second  
6 clamping surface, the inner frame being mounted with respect to the outer frame for  
7 movement between a first position in which the first and second clamping surfaces are  
8 substantially together for clamping webbing therebetween, and a second position in  
9 which the clamping surfaces are apart for allowing webbing to slide there through; and  
10 further including a tensioning mechanism, for disengaging the first and second clamping  
11 surfaces when the inner frame and outer frame are in the first position to permit the  
12 webbing to slide therebetween to enable tensioning of the webbing,

13 one of the first and second clamping members comprises a shaft, and the  
14 clamping surface of the other clamping member has a complementary curvature, so that  
15 the clamping surfaces of the first and second clamping members lie substantially parallel  
16 in the first position so that a clamping force on the webbing is distributed over a  
17 relatively large surface area of the webbing and successive parts of the outer surface of  
18 the first clamping member smoothly merge into one another without any abrupt change of  
19 direction so that the webbing is not distorted..

1     15     A webbing tie down assembly as claimed in claim 14, in which at least one of the  
2     first and second clamping members has a supporting surface, substantially opposite the  
3     clamping surface, the supporting surface being arranged to support webbing.

1     16.     A webbing tie down assembly as claimed in claim 15, in which the or each  
2     supporting surface is smoothly curved to allow webbing to slide thereon.

1     17     A webbing tie down assembly as claimed in claim 16, wherein the shaft is  
2     cylindrical.

1     18.     A webbing tie down assembly as claimed in claim 15, wherein the supporting  
2     surface is provided on the other clamping member for supporting webbing wrapped there  
3     around, the supporting surface being configured to prevent undue tension on webbing  
4     supported thereby.

1     19.     A webbing tie down assembly as claimed in claim 18, wherein the inner frame  
2     comprises a first pair of substantially parallel inner plates, and the outer frame comprises  
3     a second pair of substantially parallel outer plates, the assembly further comprising a  
4     roller shaft, wherein the first pair of substantially parallel inner plates is mounted on the  
5     roller shaft to pivot between the first and second positions, and wherein in the first  
6     position, the inner plates of the first frame lie between the outer plates of the second  
7     frame, and wherein the supporting surface extends within the boundary of the inner plates  
8     in the first position.

1     20.     A webbing tie down assembly as claimed in claim 19, further comprising a  
2     latching mechanism, for securing the inner plates with respect to the outer plates in the  
3     first position.

1     21.     A webbing tie down assembly as claimed in claim 20, wherein the first pair of  
2     substantially parallel inner plates are linked together by a handle for movement between  
3     the first and second positions.

1     22     A webbing tie down assembly as claimed in claim 20, in which the tensioning  
2     mechanism includes a pair of slots in respective ones of either the first pair of

3 substantially parallel inner plates or the second pair of substantially parallel outer plates,  
4 the roller shaft extending through the pair of slots and being rigidly mounted to the other  
5 of the first pair of substantially parallel inner plates or the second pair of substantially  
6 parallel outer plates, so that the first frame can be displaced relative to the second frame  
7 along the length of the slots.

1 23. A webbing tie down assembly as claimed in claim 22, in which the slots are  
2 curved.

1 24. A webbing tie down assembly as claimed in claim 22, in which the roller shaft  
2 forms one of the first and second clamping members and the other of the first and second  
3 clamping members is rigidly secured between the parallel plates of the frame carrying the  
4 slots.

1 25. A webbing tie down assembly as claimed in claim 14, in which the assembly has a  
2 first end and a second end, the first end carrying a hook mounted to the first or second  
3 frame for attachment to an object to be tied down, the hook secured to the first or second  
4 frame at a pair of securing points.

1 26. A webbing tie down assembly as claimed in claim 25, in which webbing enters  
2 and exits the assembly at the second end thereof, the webbing being wrapped around at  
3 least one supporting surface and between the clamping surfaces of the first and second  
4 clamping members.

1 27. A webbing tie down assembly as claimed in claim 26 in which the at least one  
2 supporting surface includes one or more pulley shafts arranged within the assembly to  
3 distribute the load of the webbing whilst spacing apart the surfaces thereof.

1 28. A webbing tie down assembly as claimed in claim 26, in which the supporting  
2 surface adjacent the second end of the assembly has a minimum radius of curvature of  
3 6.35mm.

1 29. A webbing tie down assembly, comprising:  
2 an inner frame supporting a first clamping member having a first clamping

3 surface, and an outer frame supporting a second clamping member having a second  
4 clamping surface, the inner frame and the outer frame being arranged to support webbing  
5 therein, the inner frame being mounted with respect to the outer frame for movement  
6 between a first position in which the first and second clamping surfaces are substantially  
7 together for clamping webbing therebetween, and a second position in which the  
8 clamping surfaces are apart for allowing webbing to slide there through;

9 wherein the first and second clamping surfaces are configured to provide  
10 substantially parallel surfaces in said first position so that a clamping force on the  
11 webbing is distributed over a relatively large surface area of the webbing;

12 characterized in that a cylindrical shaft forms one of the first and second clamping  
13 members whereby a part of the surface thereof provides the corresponding clamping  
14 surface, and the clamping surface of the other clamping member has a complementary  
15 curvature, so that the curved clamping surfaces of the first and second clamping members  
16 lie substantially parallel in the first position, and successive parts of the outer surface of  
17 the first clamping member smoothly merge into one another without any abrupt change of  
18 direction so that the webbing is not distorted..